

Full Length Research Paper

Development of cotton leaf curls virus tolerance varieties through interspecific hybridization

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Cotton Leaf Curl Virus (CLCuV) is a major threat in enhancing cotton production in Pakistan. Economic loss due to this disease during last decade is estimated about 75 million rupees. This disease spread in epidemic from 1992 to 1995. The first CLCuV resistant variety was evolved in 1996. Resurgence of this disease occurred in 2001 (Burewala) breaking resistance of all exiting available germplasm of cotton. Interspecific hybridization for leaf curl virus resistance is the only economical and long term approach to tackle this hazardous problem. A total of 3338 genotypes were screened at Cotton Research station Vehari during 2003 to 2004 but none of these genotypes showed resistance to this disease. Two cultivated diploid species viz *Gossypium herbaceum* A1, *Gossypium arboreum* A2, *Gossypium anomalum* B1, *Gossypium capitiviridis* B4, *Gossypium gossypoides* D6, *Gossypium laxum* D8, *Gossypium stocksii* E1, *Gossypium somalense* E2, *Gossypium areysianum* E3 and *Gossypium longicalyx* x F1 did not showed the symptoms of this disease through petiole grafting. *G. arboreum* is immune to CLCuV, two artificial allotetraploids of 2(*Gossypium hirsutum* L x *Gossypium. anomalum*).x ³*G. hirs.* and 2 (*G. arboreum* L x *G. anomalum*). x ²*G. hirs.* were manually hybridized under field conditions. These two hybrids were also crossed for gene pyramiding [{.2 (*hirs.* x *G. anom.*) x ³*G. hirs.*} x {²*G. hirs.* x 2 (*G. arbo.* x *G. anom*) x ²*G. hirs.*}] x ²*G. hirs.* Exogenous hormones containing 50 mg/l gibberellic acid and 100 mg/l naphthalene acetic acid was applied to control boll shedding. 3:1 ratio was not observed in above said combinations. Some plants were found resistant against CLCuV by using petiole grafting technique. But no resistance was observed. Maximum tolerance was found in this combination, that is, [{.2 (*hirs.* x *G. anom.*) x ³*G. hirs.*} x {²*G. hirs.* x 2 (*G. arbo.* x *G. anom*) x ²*G. hirs.*}] x ²*G. hirs.* By using this material CIM-608 has been evolved which is having high tolerance to CLCuV; this will increase cotton production and will be a source of food security.

Key words: Cotton, introgression, cotton leaf curl virus (CLCuV), tolerant.

INTRODUCTION

Cotton (*Gossypium hirsutum* L.) is the backbone of Pakistan's economy accounts for 8.6% of the value

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